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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/597,934

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Kang-Ho Ahn

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EXAMINER

DOLE, TIMOTHY J

ART UNIT

PAPER NUMBER

2858

MAIL DATE

DELIVERY MODE

10/03/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/597,934

Applicant(s)

AHN, KANG-HO

Examiner

Timothy J. Dole

Art Unit

2858

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 August 2006 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 8/11/06.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: ____.

DETAILED ACTION

Drawings

1. Figure 1 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.
2. The drawings are objected to because empty boxes: 12, 14, 16, 52, 54 and 56 in figures 1-3 should contain labels or symbols describing their function. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR

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1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

3. Claim 1-9 are objected to because of the following informalities: the claims recite the following limitations: “the number of particles” in claim 1, line 1; “the number of particles” in claim 4, line 1; “the number of particles” in claim 6, line 1; and “the number of particles” in claim 8, line 1, all of which lack antecedent basis. Claims 2, 3, 5, 7 and 9 are objected to for depending on objected independent claims 1, 4, 6 and 8, respectively. Appropriate correction is required.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1, 6 and 7 are rejected under 35 U.S.C. 102(b) as being anticipated by Liu (US 6,639,671).

Referring to claim 1, Liu discloses an apparatus for measuring a number of particles (abstract) comprising: a particle charging means (fig. 6 (188)) for charging particles to a monopolarity (column 10, lines 37-41); an inner guide duct (fig. 6 (186))

into which clean air is introduced (column 10, lines 13-18 and column 1, lines 9-11); an electrode (fig. 6 (182)) to which a high voltage is applied (column 10, line 66 – column 11, line 1), the electrode being installed in the inner guide duct in a lengthwise direction of the inner guide duct (fig. 6); a power supplying means (fig. 6 (234)) for supplying power to the electrode (column 10, line 66 – column 11, line 1); an outer guide duct (fig. 6 (184)) positioned outside the inner guide duct (fig. 6) and being longer than the inner guide duct (fig. 6), the particles charged by the particle charging means being introduced between the inner guide duct and the outer guide duct (column 9, line 63 – column 10, line 2); a particle separating means (fig. 6 (220)) having an upper end positioned at an inner lower side of the outer guide duct (fig. 6), the particle separating means separating the charged particles according to size (column 10, lines 44-65); and a particle counting means (fig. 6 (Counter)) connected to the particle separating means (fig. 6), the particle counting means counting the particles separated according to size by the particle separating means (column 11, lines 1-6).

Referring to claim 6, Liu discloses a method for measuring a number of particles (abstract) comprising steps of: charging particles to be measured to a monopolarity (column 10, lines 37-41); introducing the charged particles and clean air into a guide duct (column 9, line 63 – column 10, line 2, column 10, lines 13-18 and column 1, lines 9-11); applying a voltage to an electrode installed in the guide duct (column 10, line 66 – column 11, line 1); attaching the charged particles of a certain size or less to the electrode (column 10, lines 48-51); separating the charged particles, which are not attached to the

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electrode, according to size (column 10, lines 44-65); and measuring the numbers of the charged particles separated according to size (column 11, lines 1-6).

Referring to claim 7, Liu discloses the method as claimed wherein the size of the charged particles attached to the electrode is controlled by changing the voltage applied to the electrode (column 10, line 66 – column 11, line 6).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 2-5, 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Liu (shown above).

Referring to claim 2, Liu discloses the apparatus as claimed except wherein the particle separating means includes a plurality of particle separating ducts that are spaced apart from a lower end of the electrode, and the particle counting means includes a plurality of particle counters connected to the respective particle separating ducts.

MPEP 2144.04 (VI) (B) discloses that mere duplication of parts has no patentable significance unless a new and unexpected result is produced. Providing a plurality of separating ducts and counters in the system of Liu would simply separate the particles

into smaller groups for subsequent counting. Since there is no unexpected result, the claims are not patentably distinct from Liu.

It would have been obvious to one skilled in the art at the time of the invention to incorporate a plurality of separating ducts and counters into the apparatus of Liu for the purpose of providing a more precise particle size distribution.

Referring to claim 3, Liu discloses the apparatus as claimed wherein the particle separating ducts are concentrically installed (fig. 6 see duct (224)).

Referring to claims 4 and 8, Liu discloses an apparatus and method for measuring a number of particles (abstract) comprising: a particle charging means (fig. 6 (188)) for charging particles to a monopolarity (column 10, lines 37-41); a particle separator, comprising an inner guide duct (fig. 6 (186)) into which clean air is introduced (column 10, lines 13-18 and column 1, lines 9-11), an electrode (fig. 6 (182)) installed in the inner guide duct in a lengthwise direction of the inner guide duct (fig. 6), and an outer guide duct (fig. 6 (184)) positioned outside the inner guide duct (fig. 6), being longer than the inner guide duct and including a particle collecting portion downstream of the outer guide duct (fig. 6), the particles charged by the particle charging means being introduced between the inner guide duct and the outer guide duct (column 9, line 63 – column 10, line 2); a power supplying means (fig. 6 (234)) for supplying mutually different powers to the electrode of the particle separator (column 10, line 66 – column 11, line 1); and a particle counting means (fig. 6 (Counter)) measuring particles collected by the particle separator for calculating a size distribution of the particles based on the measured results (column 11, lines 1-6).

Liu does not disclose that there are a plurality of particle separators and particle counting means.

MPEP 2144.04 (VI) (B) discloses that mere duplication of parts has no patentable significance unless a new and unexpected result is produced. Providing a plurality of particle separators with different voltages applied to the electrodes and subsequent particle counting means would simply provide a plurality of apparatuses, each being able to detect a different particle size. Liu discloses a similar approach, where the voltage of the electrode is adjusted and the process is performed repeatedly (column 10, line 66 – column 11, line 6). Since both processes would produce the same data, there is no unexpected result and the claims are not patentably distinct from Liu.

It would have been obvious to one skilled in the art at the time of the invention to incorporate a plurality of particle separators and particle counting means into the apparatus of Liu for the purpose of providing an apparatus that can perform particle counting for a plurality of different sized particles, all at the same time.

Referring to claim 5, Liu discloses the apparatus as claimed except wherein the power supplying means includes a power source and a plurality of resistors.

It should be noted that voltage dividers made up of a power supply and a plurality of resistors are very well known in the power supply art.

It would have been obvious to one skilled in the art at the time of the invention to incorporate a power source with a plurality of resistors as the power supply means of Liu for the purpose of providing the voltage controller of Liu that is adjusted through a sequence of voltage values (column 10, line 66 – column 11, line 1).

Referring to claim 9, Liu discloses the method as claimed except wherein in the step of applying the mutually different voltages, a voltage is not applied to one of the electrodes.

It should be noted that providing a reference count of the total number particles in the separator, regardless of particle size is well known. If it is desired that none of the particles be attracted to the electrode, no voltage should be applied.

It would have been obvious to one skilled in the art at the time of the invention to incorporate an electrode with no voltage for one of the separators of Liu for the purpose of providing a count of all the particles present in the separator.

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The following patents are cited to show the state of the art with respect to particle counting.

USPN 7,145,320 to Yoshida et al.: This patent shows an apparatus for counting particles using two ducts and an electrode.

USPN 6,905,029 to Flagan: This patent shows an apparatus for counting particles using two ducts and an electrode along with the option of multiple splitters.

USPN 6,281,972 to Ebara et al.: This patent shows an apparatus for counting particles using two ducts and an electrode.

USPN 5,489,506 to Crane: This patent shows an apparatus for sorting cells according to size, using a separation plate with plural outlet holes.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Timothy J. Dole whose telephone number is (571) 272-2229. The examiner can normally be reached on Mon. thru Fri. from 8:00 to 4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Andrew Hirshfeld can be reached on (571) 272-2168. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Timothy J. Dole

